‘There we are failing’ … Infection prevention practices associated factors among nurses working in public and private newborn units in Kenyan hospitals

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Research Article

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Abstract

Background: Small and sick newborns continue to die in low- and middle-income countries as a result of among other causes, infection. Despite the existence of guidelines for infection prevention, little is known on practices and associated factors among nurses working in newborn units in many developing nations. Therefore, the objective of this study was to assess nurses' practices and their perspectives on what influences their ability to adhere to infection prevention and control (IPC) norms in newborn units.

Methods This qualitative study used an ethnographic research design to collect data. 150 hours of observations and through purposeful sampling, nurses working in the newborn units in three hospitals in Nairobi were interviewed using an interview guide. The face to face interviews lasted between 45-60 mins and were digitally audiotaped, transcribed verbatim and translated into English where necessary. Data were imported into Nvivo 10 software for management. All data were anonymised and subjected to thematic analysis.

Results A total of 10 nurses from public, 11 from private and 8 from faith-based hospitals participated in the study. Structural organization factors such as proper ward layout, adequate staffing, controlled access of visitors on the ward, involvement of a security officer and presence of an isolation room were factors that facilitated nurses' observance of infection control on the newborn units. On the other hand, overcrowding, absence of isolation room, improper ward layout, absence of hand hygiene resources, and uncontrolled presence of visitors and lack of enforcement of IPC protocol acted as barriers to non-adherence to IPC.

Conclusions Knowledge of Infection prevention and control procedures among nurses may be necessary but are unlikely to be sufficient to deliver improved care. A deliberate investment in organization factors to improve the work environment can facilitate nurses' ability to provide quality newborn care.

Background

Eighty-five percent of newborn deaths in low-resource settings are the result of among other causes, infections, (1). Data from developing countries of neonatal infections among hospital-born babies, show 3–20 times higher rates than those reported for hospital-born babies in industrialised countries (2) (Zaidi, Huskins et al. 2005, llegranzi, Nejad et al. 2011). Infection prevention and control (IPC) is a key aspect of safe and quality service. Without proper IPC, the associated morbidity, mortality, costs, and adverse effects on future health-seeking behaviour by communities pose barriers to improvement of neonatal outcomes in developing countries. Low-cost, "bundled" interventions using systems quality improvement approaches for improved infection control are possible, but should be supported by evidence in developing country settings (3).

Existing WHO guidelines on IPC at national and acute facility levels recommend regular surveillance of infections, vaccination of health care workers, appropriate visitation policies, avoidance of overcrowding and understaffing in Neonatal Intensive care units (NICU) (4). Although good hand hygiene has been

shown to be highly effective in reducing all types of healthcare associated infections (HAIs) in NICU patients, a study has shown that it is only practiced by 39% of healthcare workers on average (5). A study to understand why healthcare workers don't wash their hands in Australia found among behavioural explanations, that health care workers (HCW) simply transferred their poor community handwashing behaviour to healthcare settings (6).

There is a plethora of literature on how HCW compliance with handwashing guidelines is the result of influences from biological characteristics, environment, education, and culture, (6-9) but a dearth focussing on nurses' practices as well as associated factors that facilitate their ability to implement IPC.

Introduction

Kenya is among the 20 countries globally with the highest number of newborn deaths (10, 11). Recent statistics show that although Kenya made progress in reducing neonatal mortality between 2009 and 2014 from 33/1000 to 22/1000 live births, neonatal mortality remains high (12). Estimates show that 60% of infant deaths and 45% of all under-5 deaths occur in the first 28 days of life (12, 13). Great gains could be made if efforts to reduce child mortality focused on neonates. Improving newborn survival will require improving among other services, processes of infection prevention and control (14-18). While IPC is central to quality of care, it is highly likely to be influenced by quite local contexts. The researchers adopted an ethnographic approach to explore the nurses' IPC practices in newborn units in more depth and particularly focussing on nurses' perceptions of their IPC practices and factors influencing that.

Materials And Methods

Kenya operates a pluralistic health sector with care services being provided by the Government (public), private for profit and private not for profit (herein referred to as faith based) institutions (19) . The public sector provides approximately 50-60% of the health services, while the remaining health services are provided by the private and faith based sectors (19, 20) . This study was undertaken in one public hospital, one faith-based hospital and one private hospital, all located in Nairobi County, Kenya. The public hospital is a government run hospital offering free maternal and newborn services located near the largest informal settlement in Nairobi. At the time of this study the maternity and newborn wards were located in the only storeyed building in the hospital. The faith based hospital is a low cost Roman catholic faith-based hospital also located at the edge of the largest informal settlement in Nairobi. It began its operations in 2000 and information in the hospital leaflets and newsletter describe it as an oasis of healing in the midst of extreme hardship. The private hospital was established in 1950s but in July 2005, it formally became a teaching and tertiary referral hospital. This hospital is continually, expanding and upgrading facilities to attain international standards.

The aim of this study was to describe from newborn nurses' perspective, their practices of IPC and what organisation factors they consider as influencing their IPC practices. A descriptive ethnographic qualitative research design was used to collect data. Between January 2017 and March 2018, the first author carried out non-participant observation of 60 hours in the faith based, 36 in the private and 54 hours in public hospitals in Nairobi, Kenya. The observations covered weekdays and day shifts; conducted 29 face to face in-depth interviews with 10 nurses from public, 11 from private and 8 from faith-based hospitals through purposeful sampling. The interviews which lasted between 45 to 60 minutes were digitally audiotaped, transcribed verbatim while observation notes were typed and expanded. All data were subjected to thematic analysis.

Ethics

The research received ethics clearance from the Strathmore University and KEMRI certificate no. **KEMRI/SERU/CGMR-C/SU-IRB 0060/16/3555**. Additional permission was sought and secured from the three participating hospitals as well as Nairobi City County department of Health. In addition, every effort was made to ensure the quality and integrity of the research. I sought and received informed consent in all cases where this was relevant. Respect, confidentiality and anonymity of our research respondents was maintained and ensured through obtaining of their voluntary consent to participate in the study. All potentially identifying text was anonymised, participants' details were kept confidential and all were allocated pseudonyms to maintain anonymity.

Results

Demographic characteristics of the participants

Majority of the nurses were aged between 30-39 years. Level of training in nursing ranged from diploma to master's degree with more than half having attained a diploma. There were more degree holders in the private hospital than in the public and faith based.

Nearly half of the nurses had spent more than 10 years in their current facility, although majority were from the public hospital. Regarding years of experience as a newborn nurse, only one had more than 10 years with majority of the nurses having spent between one and six years. The characteristics of the interviewed nurses are summarised in table 1.0.

Table 1.o Demographic characteristics of participants

The findings are presented in two sections. The first section presents the IPC norms in each hospital while the second section focusses how local contexts create emergent properties within nurses' practice that

are an important influence on quality of care (QoC). I present how nurses negotiate the different healthcare contexts resulting in practical norms.

Infection prevention and control and its contribution to quality care

All nurses were cognizant of how infection prevention and control was a key process that contributes to quality care. In this regard, an IPC plan was in place in three hospitals. There were posters and other laminated materials on how health care workers, parents and visitors to the newborn unit (NBU) ought to conduct themselves in regard to IPC. The public and private hospitals also had an isolation room for babies referred from outside the hospital and for babies with a contagious disease respectively. Each hospital-specific measures to address IPC are described and compared across three hospitals followed by how nurses negotiate their practice within these contexts and their perceptions of these negotiated practice.

IPC protocols

All three hospitals controlled entry for nurses, mothers and visitors to the ward. There were instructions at the entrance on changing their home clothes and shoes for clean disinfected hospital shoes for all, and for hospital gowns for mothers and into clean nursing uniforms for nurse. Table 2.0 shows that similarities and differences in IPC norms across three hospitals.

Although visitors were allowed in the NBUs, they were however required to remove any extra clothing such as sweaters and jackets, and to fold long sleeved shirts or blouses. They were in addition instructed to wash their hands with soap and water or apply an alcohol based hand rub. All hospitals had water and soap for hand washing as well as alcohol based hand rubs visibly displayed in the NBUs, although water supply was irregular in the public.

Table 2.0 Similarities and differences in what IPC norms in the three hospitals.

There were observed differences across the hospitals in terms of controlling for visitors; availability of an isolation room as well availability of water as well adherence to handwashing. In this regard, only the private hospital expressly indicated that they allowed visitors into the ward. Moreover, only the faith-based hospital did not have an isolation room in the newborn ward. Although a 24- hour supply of water was a challenge in the public hospital, even in situations accessions when water and soap as well as the alcohol based hand rubs were available, there were no visible or verbal instructions for their use for all

who entered the ward to use them. From my observations, it was noteworthy that these norms were not fully implemented across the newborn wards.

In the next section, I present these observations and what nurses said influenced their practices.

Practical implementation of the IPC protocols

Table 3.0: Practical implementation of IPC across hospitals

From the table 3.0 there are changes on what was in table 2.0 as described below.

Public hospital

Whereas, the public hospital had indicated that no visitors were allowed in the newborn unit, in practice, visitors could be seen on the ward. Reasons given by nurses in the public hospital, were poor physical layout, understaffing, lack of enforcement to protocols uninformed mothers, insufficient gowns and sandals.

Regarding poor physical layout, the nurses at the station or in other rooms where babies are admitted, could not see the entrance and some mothers took advantage of this to sneak in relatives.

"…You see when we are seated at the nurse station, you can't see the entrance…the other problem is visitors, although we have written no visitors allowed they are sneaked in when we are busy attending to babies in either side or gone to the KMC section... and there we are failing…" Public 06

It is lunch time in public NBU, Public 04 and Public 07 are at the nurse station going through the handover process. While this is going on, relatives keep walking in and out of the NBU. Whenever Public 04 noticed strange people walking in, she would warn the mothers that visitors were not allowed in the unit due to low immunity of the babies.

Although the mothers seemed to be aware of this requirement, they just ignored it. The mothers cited the long distances their relatives had travelled to check on them and their babies while nurses thought this was a sign of low value placed on adherence to IPC.

Observation notes Public 10.02.2018

Uunderstaffing on the ward created opportunities that mothers seized to bypass the IPC requirements. The text box below describes how the only nurse on the previous shift in the public hospital is conducting a handover to an incoming nurse and literally this means the ward is unattended to, and how mothers exploit this shortcoming to sneak in their relatives.

Resource scarcity in the public such as clean hospital provided gowns and sandals led to mothers entering the ward with their own 'sanitized sandal'. A nurse explains the danger in doing so.

"… Mothers are supposed to change their home clothes and shoes, but we don't have enough for all of them. They end up with their slippers in the ward and yet they have been walking everywhere with them…" Public 02

There was a lack of observation of hand hygiene procedures by mothers and visitors. I observed that the location of the sink in the room that housed babies that were classified as critical as opposed to it being located for example at the entrance contributed to this of practice. Secondly, I did not hear any verbal instructions given to the visitors or mothers to observed hand hygiene before entering the ward or holding the baby as there was no personnel to enforce and monitor visitors' and mothers' adherence to the instructions.

Although there was an isolation room in the public hospital, I observed that babies whose condition deteriorated and needed resuscitation were shifted to the critical babies' room where the resuscitation equipment was available. Although this was in direct contravening of the isolation policy, nurses considered saving the baby's life more important.

"…This baby needs oxygen which is only available in this room, so I had to bring her in here... so, we try to avoid mortality that is what we don't want to happen to these babies…" Public 07

Faith based hospital

IPC practices in the faith based hospital were implemented according to the norms. Cognizant of resource shortages in terms of adequacy of staffing, physical space and lack of isolation room, the hospital policy allowed only babies born in the hospital to be admitted into their NBU. To control for visitors, the NBU was located at the end of the ward in a corner with two doors controlling entry. The nursing desk was located directly facing the entrance to allow the nurse to enforce handwashing instructions, removal of extra clothes and change of sandals into clean sanitised NBU sandals.

The NBU was also out of bounds for casual workers employed by the hospital to carry out cleaning, but instead nurses took upon themselves cleaning roles.

"…We try and limit traffic by only allowing in mothers, controlling for infection, not admitting babies born at home or those we have discharged and have come back. In addition, we do the cleaning of the incubators, the shoes, and the floor. The support staff don't move close to the cleaning in here. Every day (morning) we clean at least two incubators, dust the others and by the end of three days, we have cleaned all the incubators…" Faith based 01

To allow for relatives to see the babies in the NBU, the inside facing wall was made out of glass so that at the request of a mother, the curtain covering the glass wall could be folded for them to have a glimpse of the baby.

Private hospital

In the private hospital, systems of IPC control went beyond the nurses to involve the security guard who was aware as well as in-charge of enforcing the norms. I observed a very strict adherence to hand washing as well as folding of long-sleeved clothes and taking off of extra clothing such as sweaters and jackets for consultants and visitors. The following is a description by a nurse of the hospital's elaborate IPC procedures.

"…we have infection control programs – the greatest challenge for neonates is that they are prone to infections. The fact that they are born premature is a direct exposure that makes them susceptible to infections. Handwashing and sanitizing our hands in this unit must be followed strictly. There are sanitizers on the incubators of every baby – you must have noticed that outside every door there is a sanitizer. Inside the room, there is a sink, a sanitizer and a –hand scrub. For neonates, Infection is likely to be from patient to patient and the only way that the care giver can almost prevent contact infection will be proper handwashing so that an infection is not picked from one patient to another. Visitors to the unit

are restricted – the doors have a “STOP” sign, and instructions to remove your coat in order not to transfer infections from other external sources, because this is a sensitive unit. Here, everyone is very keen because you do not want to be the one responsible for spreading infections – but it has happened…” Private 09

The hospital also preferred the use disposable cups for those cup feeding to avoid contamination that could result from improper disinfection. Although visitors were allowed into the neonatal intensive unit, they were not allowed to touch the babies, instead they were allowed to see them in their incubators. However, for the parents or family designated next of kin of the babies in the neonatal high dependency unit, they were required to change into clean provided hospital gowns so they could hold the babies as well as practice kangaroo care.

From these findings, it emerges that nurses across the three hospital sectors are aware that IPC is very important in their quest to provide quality inpatient care. However, they also recognised that their work environment is important in facilitating their ability to practice IPC. How the different hospitals are physically designed and staffed either facilitated or hindered nurses IPC practices. This led to nurses in this study negotiated their practices differently, with the public hospital nurses acknowledging their failure to control for visitors. Whereas, the private hospital had put in place simple interventions such as hiring a security guard to control for visitors as well as ensuring adherence to hand washing norms, the absence of such in the public led to uncontrolled inflow of visitors. The lack of isolation room in the faith based caused the hospital to admit only in-house born babies.

Discussion

Infection prevention practice is fundamental to nurses’ ability to provide quality inpatient care. This study assessed IPC practices of nurses working in newborn units in three different health sector hospitals in Kenya. In this study, all 29 participants were aware of the importance of preventing and controlling for infections in the newborn units. There were also protocols in place to guide them on how to manage mothers and visitors entering the ward. However, factors reported and also observed such as physical layout, lack of regular water supply, and understaffing in the public hospital influenced nurses’ ability to implement IPC norms.

Previous studies on IPC practices among health care workers have focussed on knowledge gaps and on organisation contextual factors. For instance, one study showed that the ability to adhere to IPC among health care workers in Ethiopian government healthcare facilities by healthcare workers was found to be influenced by among other things, having awareness on availability of standard operating procedures and presence of continuous water supply (21). Another study conducted in a level four hospital in Kenya to determine health workers adherence to IPC policies and procedures also noted that frequent shortage of water, inadequate supplies, shortage of staff, high workload and low resources were major barriers (22). These studies and others have gone ahead to recommended among other interventions, the need to institute in-service education programs as well as close supervision of health workers (21-23). However

another study conducted at primary health care facilities in Kenya concluded that their findings were consistent with the widely discussed concept that patient safety is driven more by behavioural norms than by technical knowledge, training or the availability of supplies (24). This study has however shown that there needs to be a deliberate shift from knowledge, in-service training and supervision of health care workers to a focus on low cost organisational innovations and interventions that can support nurses quest for improvement of quality of care for newborns in LMICs.

Conclusion

Knowledge of Infection prevention and control procedures among NBU nurses may be necessary but is unlikely to be sufficient for them to deliver improved care. They need support through availability of resources. This is especially so in the public hospital where shortages were witnessed. Also in the public hospital mothers on the ward need to be sensitized to support nurses in the quest for quality care for their hospitalised babies. There is therefore a cause for managers to deliberately invest in structural organisation factors to improve the work environment if nurses have to be facilitated to provide quality newborn care.

References

1. Richards-Kortum R. Ending Preventable Newborn Death in Africa. Bulletin of the American Academy of Arts & Sciences. 2017:39.
2. Maternal health: time to deliver. PLoS Med. Edited by: PLoS Medicine Editors. 2010, 7: e1000300.
3. Allegranzi B, Nejad SB, Combescure C, Graafmans W, Attar H, Donaldson L, et al. Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis. The Lancet. 2011;377(9761):228-41.
4. WHO. World Health Statistics 2016: monitoring health for the SDGs. World Health Organization Geneva; 2016.
5. Polin RA, Denson S, Brady MT. Strategies for prevention of health care–associated infections in the NICU. Pediatrics. 2012;129(4):e1085-e93.
6. Whitby M, McLaws M-L, Ross MW. Why healthcare workers don't wash their hands: a behavioral explanation. Infection Control & Hospital Epidemiology. 2006;27(5):484-92.
7. Cohen B, Saiman L, Cimiotti J, Larson E. Factors associated with hand hygiene practices in two neonatal intensive care units. The Pediatric infectious disease journal. 2003;22(6):494.
8. Olivier C, Kunneke H, O'Connell N, Von Delft E, Wates M, Dramowski A. Healthcare-associated infections in paediatric and neonatal wards: A point prevalence survey at four South African hospitals. South African Medical Journal. 2018;108(5):418-22.

9. Lorenzini E, Costa TCd, Silva EFd. Infection prevention and control in neonatal intensive care unit. Revista gaucha de enfermagem. 2013;34(4):107-13.
10. Souza JP, Gulmezoglu AM, Vogel J, Carroli G, Lumbiganon P. Moving beyond essential interventions for reduction of maternal mortality (the WHO Multicountry Survey on Maternal and Newborn Health): a cross-sectional study. Lancet. 2013;381.
11. WHO. World Health Statistics. Geneva: World Health Organisation; 2018.
12. Government of Kenya MoH. Kenya: demographic and health survey 2014: Central Bureau of Statistics; 2014.
13. Sökmen S, Er F. Investigation of the working conditions of nurses in public hospitals on the basis of nurse-friendly hospital criteria. 2018.
14. Ayaya S, Esamai F, Rotich J, Liechty E. Perinatal mortality in the Special Care Nursery of Moi Teaching and Referral Hospital, Eldoret, Kenya. East African medical journal. 2004;81(11):555-61.
15. Darmstadt GL, Walker N, Lawn JE, Bhutta ZA, Haws RA, Cousens S. Saving newborn lives in Asia and Africa: cost and impact of phased scale-up of interventions within the continuum of care. Health Policy and Planning. 2008;23(2):101-17.
16. Lawn JE, Blencowe H, Oza S, You D, Lee ACC, Waiswa P, et al. Progress, priorities, and potential beyond survival. The Lancet. 2014.
17. Bhutta ZA, Das JK, Bahl R, Lawn JE, Salam RA, Paul VK, et al. Can available interventions end preventable deaths in mothers, newborn babies, and stillbirths, and at what cost? The Lancet. 2014.
18. Dickson KE. Health-systems bottlenecks and strategies to accelerate scale-up in countries (Journal article). 2014.
19. Kenya Go. Kenya Service Availability and Readiness Assessment Mapping (SARAM). Ministry of Health Nairobi; 2014.
20. Population NC-oAf, MEASURE/DHS+ OM. Kenya Service Provision Assessment Survey, 2004: Ministry of Health; 2005.
21. Sahiledengle B, Gebresilassie A, Getahun T, Hiko D. Infection prevention practices and associated factors among healthcare workers in governmental healthcare facilities in Addis Ababa. Ethiopian journal of health sciences. 2018;28(2):177-86.
22. Gichuhi AW, Kamau SM, Nyangena E, Otieno-Ayayo ZN. Health care workers adherence to infection prevention practices and control measures: A case of a level four district hospital in Kenya. American journal of nursing science. 2015;4(2):39-44.
23. Eskander HG, Morsy WYM, Elfeky HAA. Intensive care nurses' knowledge & practices regarding infection control standard precautions at a selected Egyptian cancer hospital. prevention. 2013;4(19):160-74.
24. Guadalupe B, Amy D, Khama R, Njeri M, Francis W, Jorge C. Observations of infection prevention and control practices in primary health care, Kenya. Bulletin of the World Health. 2017;95:481-544.

Tables

Characteristic	Sector		
	Public	Private	Faith based
Age distribution			
20-29	0	1	4
30-39	4	8	2
40-49	5	2	2
50 and above	1	0	0
Training level			
Diploma	8	4	6
Higher Diploma	2	0	1
Bachelors	0	6	1
Masters	0	1	0
Time in NBU			
Range in months and years	2 months to 8 years	6 months to 7 years	1 to 18 years
Mode	3.5 years	2.5 years	4 years

Table 1: *Demographic characteristics of the study sample*

PC Norm	Hospital Sector			
	Sub norm	**Public**	**Faith based**	**Private**
	Entry for visitors	Not allowed	Not allowed	Allowed
	Change of clothes and shoes	Yes	Yes	No, for [2]NICU, but yes for [3]NHDU
ining entry into ward	Door available to control movement	Yes	Yes	Yes, and also Security guard
	Posters available for change of clothes	Yes, at the entrance to the NBU	Yes, at the entrance to the NBU	Yes, at the reception of the NBU
	Posters available for washing of hands	No	Yes	Yes
	Water and soap available	Yes, not all times	Yes	Yes
	Sanitizer available	Yes	Yes	Yes
ide the ward	Changing rooms	Yes, at the back of ward	Yes, outside the NBU	Yes, at the back of the ward
	Isolation room	Yes	No	Yes, in NHDU
	Disinfectant facilities for cup feeding babies	Yes	Yes	Not applicable

Table 2.0 Similarities and differences in what IPC norms in the three hospitals.

Practical implementation of the IPC protocols

IPC Norm	Hospital Sector			
Gaining entry into the ward	**Sub norm**	**Public**	**Faith based**	**Private**
	Entry for visitors	Allowed	Not allowed	Allowed
	Change of clothes and shoes	No for mothers	Yes	No, for [4]NICU, but yes for [5]NHDU
Inside the ward	Hand hygiene observed by nurses	Yes	Yes	Yes
	Hand hygiene observed by mothers	N0	Yes	Yes
	Hand hygiene observed by visitors	No	N/A	Yes
	Isolation norms adhered to	No	No	Yes

Table 3.0: Practical implementation of IPC across hospitals

[1] IPC- Infection prevention control

[2] NICU- Neonatal intensive care unit

[3] NHDU- Nepnatal High Dependency Unit

[4] NICU- Neonatal Intensive Care Unit

[5] NHDU- Neonatal High Dependency unit